

REMARKS

The drawings are replaced by substitute sheets that comply with the Examiner's objections. Acceptance of these substitute sheets of drawings is respectfully solicited.

New claims 27-48 are presented for consideration. New claim 27 is similar to previously examined claim 1 and specifies the reference symbol comprises "a plurality of successive repetition patterns". This is described at page 3, lines 2-4, page 4, lines 19, 20 and page 12, lines 4-13 of the specification. In addition, claim 27 states that the last repetition pattern is phase-shifted in relation to the other repetition patterns. This is described at page 12, lines 7-9.

New claim 38 is a method claim directed to the method performed by the apparatus of claim 27.

In the Final Office Action, claims 1-3 and 14-16 were rejected as being anticipated by Ballarin (EP 0 702 467). Claims 5, 8, 18 and 21 were rejected as being obvious in view of Ballarin. Claims 7 and 20 were rejected as being obvious in view of the combination of Ballarin and Nakajima (U.S. Pat. 5,005,144). Claims 6, 9-13, 19 and 22-26 were found to define patentable subject matter.

The previous rejection of the claims is rendered moot by the cancellation of original claims 1-26. It is submitted that new claims 27 and 38 are neither anticipated nor rendered obvious by Ballarin, taken alone or in combination with other prior art. Ballarin describes synchronization in a digital telecommunication system using a first series of repeating signals modulated by the states A and B of the constellation in the order ABABAB ... and a second series of repeating signals modulated by the states C and D of the constellation in the order CDCDCD ... (see col. 3, lines 8-12 of the equivalent Ballarin U.S. Patent 6,009,125).

Correlation is effected with a reference sequence comprising symbols AB placed on one side of the transition and symbols CD placed on the other side of the transition (col. 3, lines 19-27), see also col. 4, lines 10-15. As shown in Fig. 1 of Ballarin, each of states A, B, C and D is a constellation point with a real and an imaginary part in the QAM4 modulation scheme. It is appreciated, the state of a constellation refers to the state of modulation, that is, the signal is modulated based upon states of a constellation. But, there is no suggestion in Ballarin regarding the content of the signals that are mapped onto these constellation states.

On the other hand, and contrary to the teachings of Ballarin, the reference symbol used in the present invention comprises “a plurality of successive repetition patterns.” In other words, the same repetition pattern is repeated a plurality of times within the reference symbol. As stated in, for example, claim 27, “the last repetition pattern is phase-shifted in relation to the other repetition patterns.” Consequently, the synchronizing performance and reliability are greatly enhanced, as is apparent from the simulation results shown in Figs. 8 and 12 of the present application, and described at page 7, lines 19-22 of the specification. Ballarin does not describe the use of a “plurality of successive repetition patterns” within a reference symbol, much less phase-shifting the last repetition pattern in relation to the other repetition patterns. Consequently, claim 27 is neither anticipated nor rendered obvious by Ballarin.

The aforescussed limitations in claim 27 also are recited in claim 38. Consequently, claim 38 is patentable over Ballarin for the same reasons discussed above.

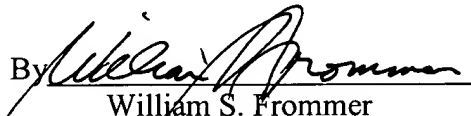
Claims 28-37 depend from claim 27 and claims 39-48 depend from claim 38 and thus include the limitations recited by their respective independent claims. At least for this reason alone, claims 28-37 and 39-48 likewise are patentably distinct over Ballarin.

Statements appearing above in respect to the disclosures in the cited reference represent the present opinions of the undersigned attorney and, in the event the Examiner disagrees with any of such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the reference providing the basis for a contrary view.

Please charge any additional fees that may be needed, and credit any overpayment, to our Deposit Account No. 50-0320.

Respectfully submitted,

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